

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET (Pursuant to NAC 445A.236) March 2010

PERMITTEE NAME: City of Carlin
P.O. Box 787
Carlin, Elko County, Nevada 89822

PERMIT NUMBER: NEV93001

LOCATION: City of Carlin Wastewater Treatment Facility
101 South Eighth Street
Carlin, Elko County, Nevada 89822

Latitude: 40° 42' 50" North
Longitude: 116° 05' 40" West

Township 33 North, Range 52 East, Section 26

FLOW: 30-Day Average: 0.5 million gallons per day
Daily Maximum: 0.9 million gallons per day

PUBLIC WATER SUPPLY: Within 6,000-foot buffer zones for:
Carlin Honor Camp, Nevada Department of Corrections;
Private Well, designated Sharons; and
Private Well, Dovetail Ranch.

GENERAL:

The Carlin Wastewater Treatment Facility uses aeration and facultative treatment ponds to treat up to 0.9 million gallons per day of domestic wastewater from residential and commercial properties in the City of Carlin. The 30-day average design flow is 0.5 million gallons per day.

Fundamental elements of the treatment system include a wet well with a barscreen for bulk material removal, aeration in a primary lagoon (Lagoon Cell 1), and facultative treatment in a secondary lagoon (Lagoon Cell 2). Both lagoons are clay (bentonite) lined and have holding capacities of 16.3 million gallons (10 acres) and 11 million gallons (8.4 acres) in Lagoon Cell 1 and Lagoon Cell 2, respectively.

Wastewater is treated to meet secondary treatment standards before discharge to: (1) cultivated irrigation fields, (2) pasture irrigation areas, (3) two rapid infiltration basins (East and West) cumulatively covering 5.1 acres, or (4) emergency irrigation using the south sand field. Predominant disposal mechanisms are field irrigation and evaporation/percolation in the 15-acre, 75-million gallon, unlined storage reservoir. If the storage reservoir reaches maximum capacity, excess treated wastewater discharges to the rapid infiltration basins.

Flood irrigation using treated effluent is conducted in accordance with an Effluent Management Plan (EMP), which must be submitted to, and approved by, the Nevada Division of Environmental Protection, Bureau of Water Pollution Control (BWPC) before beginning reuse irrigation activities. An EMP is included in the **City of Carlin Treatment Plant Upgrade Operations and Maintenance Manual** on file at the BWPC, received October 8, 2005, and approved October 26, 2005.

DISCHARGE CHARACTERISTICS

Wastewater for discharge is required to be treated to meet secondary treatment standards. Secondary treatment standards include discharge limitations on biochemical oxygen demand (BOD), total suspended solids (TSS), and pH. Concentrations of total nitrogen and total kjeldahl nitrogen as nitrogen (as N) are required to be monitored and reported to track and correlate nitrogen compound concentrations in the effluent with concentrations observed

observed at monitoring well locations. Effluent data reported for the 2nd (nitrogen species) and 3rd quarters 2009 indicate the following typical discharge concentration ranges:

Inhibited BOD:	9 – 27 mg/L
Total Suspended Solids:	27 - 55 mg/L
pH:	7.5 – 9.1 SU
Total Nitrogen:	<1.0 mg/L*
Total Kjeldahl Nitrogen:	12.5 mg/L*

*: Analyzed and reported once during each 2nd and 3rd quarter, annually.
mg/L: milligram per liter
SU: Standard Units

The facility has periodically exceeded discharge limitations since the permit was issued in 1999; however, documented occurrences appear random and episodic. For instance, since 2002, pH exceeded the upper limitation of 9.0 standard units (SU) in March 2002 (9.2 SU), April 2002 (9.4 SU), April 2003 (9.4 SU), and August 2004 (9.1 SU). The discharge exceeded the CBOD limitation of 45 mg/L in May 2003 (49 mg/L). Similar discharge discrepancies occurred between 1999 and 2000, which were remedied through operational corrections and/or periodic system optimization.

RECEIVING WATER CHARACTERISTICS

Treated effluent is discharged to groundwater of the State of Nevada. Discharge limitations to groundwater are based, in part, on primary drinking water standards adopted by the State of Nevada. The primary drinking water standard for Total Nitrogen as N is 10 mg/L.

Groundwater in the vicinity of the facility is relatively shallow, ranging from 1.3 to 18 feet below grade surface (bgs), depending on the location of the well and the season. The treatment facility, primary irrigation fields, and pastures are adjacent to the Humboldt River on the north side, while the storage reservoir, east and west rapid infiltration basins (RIBs), and sand field are immediately south of the Humboldt River.

Groundwater is monitored using five (5) wells located between discharge locations and the Humboldt River. Monitoring wells MW-1 and MW-2 are located between the West RIB and East RIB, respectively, and the Humboldt River. Monitoring wells MW-3, MW-4, and MW-5 are located immediately south of the West Irrigation Field, the Central Irrigation Field, and the East Irrigation Field, respectively, between the irrigation sites and the Humboldt River.

Groundwater characteristics for depth, nitrate concentrations, TDS and chloride concentrations reported for 2nd and 3rd quarters 2009 (average of the two quarters) and are as follows:

Well Location	Depth to Water (feet bgs)	TDS (mg/L)	Chloride (mg/L)	Nitrate (mg/L)
MW-1	9.0	1020	125	3.45
MW-2	8.4	495	39	<0.5
MW-3	7.4	585	55	<0.05
MW-4	6.10	770	135	1.35
MW-5	2.2	1300	165	<0.05

The Annual nitrogen load is determined based on the nitrogen budget described in the EMP. The total annual nitrogen applied (lbs/acre/year) shall not be greater than the total annual nitrogen uptake (lbs/acre/year). Calculations and monitoring data shall use the **total nitrogen** in the applied wastewater (monitored by the treatment facility), total nitrogen from fertilizer applications, nitrogen uptake by crops or vegetation, evapotranspiration rate, precipitation rate, and fraction of applied nitrogen removed by denitrification and volatilization.

PROPOSED LIMITATIONS

During the period beginning on the effective date of this permit and lasting until the permit expires, the Permittee is authorized to discharge from:

- Outfall 001: Treated wastewater from the City of Carlin Wastewater Treatment Facility to groundwater of the State of Nevada.
- Outfall 002: Irrigation fields: East, Central, and West (during the growing season).

Excess effluent which cannot be stored in the reservoir for irrigation use may be discharged to:

- Outfall 003: Rapid Infiltration Basins: East and West;
- Outfall 004: Pasture Irrigation Areas: East and West; and/or
- Outfall 005: South Sand Field (emergency irrigation).

Samples taken in compliance with the monitoring requirements specified below shall be taken at the following locations: at the influent pump station; and effluent prior to reuse or disposal. If effluent analysis results from Lagoon Cell #1 exceed any discharge limitations, the Permittee shall promptly resample (within two (2) days of receiving results from the lab) at Lagoon Cell #2 to demonstrate compliance. The discharge shall be limited and monitored by the Permittee as specified below.

Confirmation samples or discharge parameter measurements shall be collected at the:

- Influent: At the influent pump station (wet well pump);
- Effluent: At the discharge of Lagoon Cell 2 prior to disposal; and
- Irrigation: Prior to discharge for purposes of flood irrigation.

The discharge shall be limited and monitored by the Permittee as specified below:

Table I.1

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	30 - day Average	Daily Maximum	Sample Locations	Measurement Frequency	Sample Type
Flow	0.50 MGD	0.90 MGD	Influent	Continuous	Meter
	M&R 001, 003	M&R 001, 003	Effluent to storage & RIB's	Continuous	Meter
	M&R 002, 004, 005	M&R 002, 004, 005	Effluent to Irrigation	During Irrigation	Meter or Calculate
	Quarterly Average	Daily Maximum	Sample Locations	Measurement Frequency	Sample Type
BOD (inhibited)	M&R	M&R	Influent	Monthly	Composite
	30 mg/l	45 mg/l	Effluent	Monthly	Composite
Total Suspended Solids	M&R	90 mg/l	Effluent	Monthly	Composite
PH	M&R		Influent	Monthly	Discrete
	Shall not be less than 6.0 SU nor greater than 9.0 SU		Effluent	Monthly	Discrete
Total Nitrogen as N	M&R	M&R	Effluent	Quarterly	Composite
Annual Nitrogen Applied (pounds/acre/year) ¹	M & R		Irrigation	Annual	Calculation (cumulative) ²

- 1: The Annual nitrogen load is determined based on the nitrogen budget described in the EMP. The total annual nitrogen applied (lbs/acre/year) shall not be greater than the total annual nitrogen uptake (lbs/acre/year). Calculations and monitoring data shall use the **total nitrogen** in the applied wastewater (monitored by the treatment facility), total nitrogen from fertilizer applications, nitrogen uptake by crops or vegetation, evapotranspiration rate, precipitation rate, and fraction of applied nitrogen removed by denitrification and volatilization.
- 2: The allowable value (pursuant to the approved EMP) must be reported in the 4th quarter DMR along with the actual applied value to directly evaluate for compliance.
- MGD: million gallons per day
 mg/L: milligrams per liter
 as N: As nitrogen
 M&R: Monitor & Report
- BOD: Biochemical oxygen demand
 (inhibited refers to carbonaceous)
 SU: Standard Units
 EMP: Effluent Management Plan

Groundwater Monitoring

Monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5 shall be sampled for the presence of nitrogen compounds, total dissolved solids (TDS), and chloride. Measurements of depth to groundwater and groundwater elevation will also be required on a quarterly basis. Wells shall be monitored in accordance with permit conditions and sampling and analysis protocol defined in the facility Operations and Maintenance (O&M) Manual.

Should long-term monitoring results or facility operation require the installation of additional monitoring wells, all wells shall be incorporated into the required monitoring schedule. Subsequent monitoring wells installed shall be constructed in accordance with “WTS-4: Monitoring Well Design Requirements” (NDEP, February 1997). The installation and use of additional wells must be reported to the Division and amended to the groundwater monitoring program (requirements) as a minor modification to the permit.

Groundwater wells shall be monitored according to the following parameters:

Table I.2

PARAMETER	LIMITATIONS	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE
Depth to Groundwater (feet)	Monitor & Report	Each Well	Quarterly	Field Measurement
Groundwater Elevation (feet above msl)	Monitor & Report	Each Well	Quarterly	Calculate
Total Nitrogen as N (mg/L)	10	Each Well	Quarterly	Discrete
Nitrate as N (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete
Chlorides (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete
Total Dissolved Solids (mg/L)	Monitor & Report	Each Well	Quarterly	Discrete

msl: mean sea level
 mg/L: milligram per liter

as N: as Nitrogen

If Total Nitrogen as nitrogen (as N) concentrations measured in groundwater increase to:

- i. 7.0 mg/L, the Permittee shall notify the Division immediately (within 5-days of becoming aware of the condition), and within 30-days after notifying the Division, the Permittee shall submit a plan for the reduction of nitrogen in groundwater that includes a proposal for an alternative method of disposal. Modifications to the EMP shall be incorporated in an effort to improve discharge management practices which increase nitrogen uptake by vegetation and/or adjust other nitrogen sources. The plan and the revised EMP is subject to Division approval and must receive approval in order to satisfy this condition.
- ii. 9.0 mg/L, the Permittee shall begin implementation of the plan and shall execute all corrective action

necessary to ensure no further degradation of groundwater.

- iii. 10.0 mg/L, the Permittee shall discontinue the use of reclaimed wastewater and the discharge to groundwater shall cease, unless otherwise authorized by the Division.

SCHEDULE OF COMPLIANCE

Upon issuance, the Permittee shall implement and comply with the provisions of the permit and the following schedule of compliance, including in said implementation and compliance, any additions or modifications the Administrator may make in approving the schedule of compliance:

- a. **Upon issuance of the permit**, the Permittee shall achieve compliance with all discharge limitations; and,
- b. **Within 45 days of the permit issue date (date)**, the Permittee shall submit an updated Operations and Maintenance (O&M) Manual prepared in accordance with guidance document **WTS-2: Minimum Information Required for an O&M Manual**. An Effluent Management Plan (EMP), which shall also be updated in accordance with **WTS-1B – Guidance Criteria for Preparing an Effluent Management Plan (EMP)**.
- c. If no updates are needed for either the O&M Manual and/or the EMP, then state that in writing **within 30 days of the permit issue date (MM, DD, YY)**:

PROPOSED DETERMINATION

The Division has made the tentative determination to issue (renew) the proposed permit for a 5-year period. In accordance with Nevada Administrative Code (NAC) 445A.232, this discharge is classified under the category of a *Discharge of Domestic Wastewater 500,000 gallons or more but less than 1,000,000 gallons daily*.

PROCEDURES FOR PUBLIC COMMENT

Notice of the Division's intent to issue a permit authorizing the facility to discharge to groundwater of the State of Nevada, subject to the conditions contained within the permit, is being sent to the **Reno Gazette Journal** for publication. Notice is also mailed to interested persons on our mailing list and contacts for pumping wells identified within 6,000-feet of the discharge. Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice, and must be postmarked, faxed, or e-mailed by 5:00 p.m. on **April 9, 2010**. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant; any affected State; any affected interstate agency; the Regional Administrator; or any interested agency, person, or group of persons. The request must be filed within the comment period, indicate the interest of the person filing the request, and cite the reasons why a hearing is warranted. Public hearings granted by the Division are conducted in accordance with NAC 445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: Kristen M Rose
February, 2010